

ABSTRACT

A step down voltage regulator including devices designed to operate over a maximum rated voltage lower than the supply voltage. The regulator comprises an output regulation device coupled to the supply voltage and an output; and an output device protection circuit responsive to the supply voltage and the output to ensure that the maximum rated voltage of the output device is not exceeded. Also provided is a method for operating a voltage regulator in a memory system. The method includes the steps of: providing a voltage regulator having an input and an output, and including a plurality of devices operating at a maximum rated voltage less than the voltage provided at the input; and controlling the gate voltage of the output device responsive to a load on the regulator output, so that the maximum rated voltage is not exceeded.